

Trading Areas ("MTAs"), the 194 telephone LATAs, or a Nationwide license.²⁷

Whatever else the Commission does in this Docket, it must, at the very least, ensure that all PCS providers (including cellular) have the same service areas. For there to be competitive equity, this means that the appropriate license area for 2 GHz PCS must be the same as the MSA and RSA license areas employed for cellular services.

If new 2 GHz PCS providers are given larger coverage areas than cellular providers and cellular providers are not allowed to obtain, or do not obtain, similar licenses, then the cellular carriers will be placed at a significant competitive disadvantage vis-a-vis the new entrants. Coverage area is the single most critical selling point for wireless services. If one wireless service provider has a larger coverage area than another, it will enjoy substantially greater success in selling its services, and the carrier with the smaller service area will be at a significant competitive disadvantage vis-a-vis that carrier.²⁸ Consequently, the Commission should adopt the

²⁷NPRM, paras. 56-61.

²⁸As noted in SBC's comments in RM-8012, cellular companies affiliated with the Bell Holding Companies have been competitively disadvantaged by the MFJ's LATA restrictions and by the requirement that their customers be forced (by equal access) to purchase long distance service from interexchange carriers at retail rates higher than what non-BOC cellular carriers can obtain. To eliminate this inequity, SBC and others have suggested that the Commission support their efforts to have the LATA restrictions removed

same service areas (MSAs/RSAs) for new 2 GHz PCS licensees as have been adopted for cellular service licensees.

If the Commission decides to use a larger service area than MSAs and RSAs, it should select the 487 BTAs and reject the 47 MTAs, the 194 telephone LATAs, and the possibility of Nationwide licenses. The 487 BTAs should be preferred over larger license areas because the initial investment to offer PCS is likely to be very large. If the service area is too expansive, many small entrepreneurs could be foreclosed from participating.²⁹ Small entrepreneurs may not be able to secure the necessary funding to build out systems capable of serving an entire licensed area as large or even larger than a BTA. *Ergo*, by adopting service areas larger than BTAs, the Commission could be limiting diversity and making a number of small entrepreneurs *de facto* ineligible for PCS licenses. As Commissioner Barrett points out, that result would not be in the public interest.³⁰

In no event should the Commission adopt nationwide licensing or LATA-based licensing for 2 GHz PCS. A

for wireless services. *Motion of the Bell Companies for Removal of Mobile and Other Wireless Services from the Requirements of Section II of the Decree* (filed December 13, 1991).

²⁹For example, just one of the 47 MTAs extends from Monroe, Louisiana to Dallas/Fort Worth, Texas and then to Hobbs, New Mexico.

³⁰*Separate Statement Of Andrew C. Barrett*, GEN. Docket No. 90-314 (July 16, 1992).

nationwide license would completely bar any opportunity that small entrepreneurs might have to participate in PCS. It could prevent expeditious service deployment because of the need to build large systems, and would be the alternative that would be least likely to encourage competition and service diversity. Nationwide licensing for 2 GHz PCS would also result in fewer equipment suppliers, higher PCS costs, and a *de facto* technical standard resulting in less technical diversification and experimentation. Finally, nationwide licensing would effectively limit cellular and LEC participation, and result in many existing cellular customers simply leaving their existing providers in favor of the nationwide licensees.³¹

LATA licensing should also be rejected. LATA boundaries are drawn without reference to anything which

³¹NPRM, para. 6. It would be relatively easy for the nationwide licensees to siphon off customers from existing cellular companies. Such a result would occur because the company with a nationwide license could, unlike existing cellular operators, provide nationwide roaming and eventually serve all mobile service customers on its own networks end-to-end. Under this scenario, BOC and other cellular companies would, at the very least, lose most of the business of companies with nationwide or regional operations. With a choice between an existing cellular company with limited area service and a regional or nationwide licensee, such companies would obviously choose the provider with the larger coverage area. LECs would also not be viable competitors to nationwide licensees because their networks are designed according to wire center geography, and few of them have the current capability or authorizations to provide nationwide service. Thus, nationwide licensing would preclude both cellular and LEC participation in many instances and would effectively deny consumers the benefits of these companies experience and services.

reasonably approximates meaningful wireless service boundaries. Using LATA areas would compound confusion to customers by making it even more difficult to explain coverage areas to them. Most customers do not understand, want to understand, or wish to be confined by LATA boundaries. Also, it would make little sense to adopt LATA boundaries for PCS when there are proposals currently before the Department of Justice to have the LATA boundaries removed for existing and future wireless services.³² Lastly, adopting LATA boundaries for PCS could disadvantage new PCS providers vis-a-vis certain non-BOC cellular carriers, who are not restricted to LATA boundaries.

To avoid these obviously unfair and inequitable results, the Commission should adopt service area "parity" for all PCS providers, including cellular. Service areas should be identical for all existing and newly licensed PCS providers.

F. The Commission Should Adopt Licensing Procedures That Are Likely To Deter Speculators.

The Commission seeks comment on the options it has for selecting among mutually exclusive PCS applications. It identifies three options: (1) comparative hearings, (2) lotteries, and (3) competitive bidding, if allowed by Congress.³³

³²See *Motion of the Bell Companies*, referenced, *supra*.

³³NPRM, paras. 82-92.

While the comparative hearing process may be the most thorough method and the method most consistent with the Commission's statutory obligations, it is also the most time consuming and for that reason was not used in the cellular licensing process. Instead, the Commission used lotteries.

If lotteries are chosen as the licensing mechanism for PCS, SBC suggests that the Commission use a "qualified" lottery. Under the qualified lottery method, applicants would be required to meet certain threshold requirements pertaining to financial viability, technical expertise, managerial experience, and a demonstrated commitment to offer the proposed service. These requirements are necessary to avoid a flood of applications from mere speculators without the intention, much less the capability, to ever construct a PCS system.

If competitive bidding (i.e., an auction) is authorized and employed, then SBC suggests the use of the sealed second bid format. Under this method, each bidder would submit one bid without knowledge of the others. The highest bidder would win, but would pay the amount of the second highest bid. This process would encourage each bidder to focus on the true value of the license and to submit a bid which would more closely approximate the true value of the item.³⁴

³⁴See Terrence J. Schroepfer "Allocating Spectrum Through The Use Of Auctions," 14 *Hastings Communications And Entertainment Law Journal* (Comm/Ent) 35 (1991).

If the Commission selects the competitive bidding method, it should still require that all applicants be "qualified," i.e., ready, able and willing to begin and complete construction of the proposed system within a specified time period. It should also require the same submissions required in "qualified" lotteries to deter applications from mere speculators.

Assuming a qualified applicant, SBC agrees that the license awarded to that applicant should be for a period of ten years with a renewal expectancy. For reasons stated earlier, the license terms and requirements should be the same as are determined for cellular. If those terms and requirements are changed as a result of the Commission's investigation of the Part 22 rule changes in Docket No. 92-115, those same changes should be incorporated into new Part 99 of the Commission's rules on Personal Communications Services. Without such modifications, parity in PCS licensing cannot be achieved.

G. Regulation Of PCS Services Should Be Equal For All PCS Licensees.

In determining whether common carrier versus private carrier regulation should be applied to PCS, the focus should again be on parity among both existing and newly licensed PCS providers. All such providers should be regulated on the same basis.

Because several existing PCS providers are regulated as radio common carriers, it would appear that the

only way in which to achieve competitive equity among PCS providers would be to classify all such companies as common carriers. Such a classification would recognize that there is and will be no practical distinction in terms of the kinds of services that the existing and newly licensed PCS providers will provide.

Applying radio common carrier regulation to providers of existing and newly licensed PCS should not mean, however, that regulation of those providers should increase. To the contrary, with additional PCS competition, the need for existing regulation is diminished, and whatever regulation is adopted should be very minimal.

H. International Considerations Should Not Drive Or Control This Commission's Decisions Concerning PCS Licensing.

The *NPRM* discusses international considerations impacting the Commission's numerous decisions on PCS.³⁵ Although SBC believes that international and global considerations are pertinent, they should not drive or control the Commission's decisions on these issues.

The U.S. has considerably less spectrum readily available for PCS assignment than other countries. As a consequence, the U.S. must be more concerned with spectrum efficiency and utilization than other world administrations, and must adopt standards that are specifically tailored for the situation in this country. Therefore, SBC recommends

³⁵*NPRM*, paras. 17, 27-28, 133-139.

that the Commission not rely too heavily on global developments and considerations.³⁶

The Commission should, however, encourage the development of a common air interface. A common air interface would enhance U.S. competitiveness in global markets and ensure that new developments and future enhancements follow the technology rather than the particular provider of the technology. With a common air interface, manufacturers may not have to market equipment for two different types of PCS systems, and this may increase the opportunities for PCS providers to have more equipment suppliers to choose from thereby stimulating competition and lowering equipment costs. Thus, SBC supports the development of consistent U.S. and global standards for a common air interface.

IV. TECHNICAL ISSUES.

- A. The Commission Should Expressly Allow Active Avoidance (Signal Level Measurement) Techniques To Be Employed In Meeting Interference And Coordination Requirements.

The Commission solicits comment on the appropriate method of determining potential interference to microwave

³⁶Nevertheless, SBC is encouraged by the recent work in CCIR Task Group 8/1 in which the concept of international framework documents will be developed, while detailed regional and national standards would be developed within regions and countries as needed. This arrangement would provide the ability to tailor standards to the national needs, while preserving the benefits of international compatibility.

operations and of coordinating systems to avoid such interference. The Commission proposes that existing propagation models be used in making such calculations.³⁷

SBC does not believe that existing propagation models are sufficiently accurate to meet the needs of PCS providers sharing spectrum in areas with a high density of fixed microwave links. Based upon the results of SBC's research and experimentation, it is necessary in such areas to use measurement-based methodologies (like Southwestern Bell's IMASS technique) to accurately determine which spectrum segments are available for use by PCS devices and base stations, and to avoid interference to incumbent fixed microwave operations. Existing propagation models will not necessarily satisfy those requirements.³⁸

To recognize this deficiency, the Commission should modify its proposal and Appendix F to permit the use of "active avoidance" or measurement-based techniques in determining the potential for interference and avoiding same. This modification would include expressly recognizing as permissible the use of "active avoidance" methodologies for automatically and dynamically ensuring compliance with various requirements. Such requirements include coordination criteria equivalent to EIA/TIA Bulletin TSB-10

³⁷NPRM, paras. 112, 113, 117, 118, 119, and Appendix F.

³⁸See *Southwestern Bell's Quarterly Progress Report*, No. 2, pp. 2-85 through 2-86.

limits, proper weighting factors to account for PCS user density, proper coordination distances, and proper power addition methodologies.

An appropriate measurement-based system, like IMASS, periodically conducts and analyzes microwave signal level measurements from duplex links to determine the degree of radio frequency ("RF") isolation from each PCS user to all co-channel and adjacent-channel microwave systems. The measurement-based technique enables an accurate determination of RF isolation for duplex links without assuming the validity of any propagation model or requiring a detailed geographical data base. The fact that microwave signal level measurements are performed periodically allows the system to respond to environmental changes of many types, and to meet a number of interference objectives.³⁹

At this time, there is insufficient proof that sufficiently robust propagation modeling tools exist to provide adequate PCS spectrum, while ensuring no harmful interference to fixed microwave operations in areas with a high density of fixed microwave facilities. Indeed, no single known statistical propagation model is valid to the degree required to facilitate spectrum sharing in such

³⁹See *Southwestern Bell's Quarterly Progress Report*, No. 2, pp. 2-98 through 2-99; 2-103 through 2-110. IMASS takes into account diffraction and reflection, polarization, foliage related effects, and also monitors nearby fixed microwave transmitters, employs noise burst suppression, has intermodulation distortion etc.

locations. As such, it will be necessary to use measurement-based systems and "active avoidance" techniques to provide sufficient interference protection and coordination in those areas. The Commission should recognize this fact and modify its proposal to allow the use of measurement-based system techniques in lieu of propagation models to meet the interference protection and coordination requirements for such locations.

B. The Commission Should Reconsider Its Proposal On Unlicensed PCS Devices.

The Commission proposes to allocate the 1910 to 1930 MHz band for unlicensed PCS devices.⁴⁰ The band is currently used for one-way transmissions. The Commission concludes that this band is lightly loaded, and that use of unlicensed devices in the band is not likely to cause harmful interference to private fixed operational microwave links also using the band.

SBC's experimentation in Houston, Texas indicates that the proposal for unlicensed operation is not viable, because unlicensed devices will unavoidably interfere with fixed microwave licensees in some areas. Fixed microwave receivers utilized for the 1900-1910 and 1930-1940 MHz channels have 30 dB selectivity bandwidths of up to 18 MHz and, as a consequence, will be susceptible to interference from unlicensed devices operating in the 1910 to 1930 MHz

⁴⁰NPRM, para. 43.

band. Thus, if use of unlicensed devices in this band is permitted, it may be necessary to totally clear the 1905, 1915, 1925, and 1935 MHz channels in order to prevent interference from and to the unlicensed devices.

The Commission's statement or inference that its proposal will only require the potential relocation of 28 microwave receivers in the top 50 MSAs is unclear, and the inference appears to be incorrect.⁴¹ SBC's study shows that as many as 34 microwave receivers in the Houston, Texas area would be affected. In addition to those systems, possibly hundreds of systems could be affected nationwide and would have to be relocated.

Contrary to the Commission's apparent belief, it is not likely based upon SBC's studies that power limits would be sufficiently low so that the unlicensed PCS devices would receive interference before they would cause interference to a nearby microwave operation.⁴² A microwave transmitter at the other end of the microwave link in the 1910-1930 MHz frequency band may be 10 to 25 miles away and quite difficult to detect with a PCS receiver. Because of this, a requirement to monitor the PCS channel before transmitting may be of little use if there is a microwave receiver in the general area, and thus will be insufficient to prevent harmful interference from the unlicensed device

⁴¹NPRM, n.31, para. 43.

⁴²NPRM, para. 123.

to the microwave system. For each of these reasons, the Commission may want to reconsider its tentative decision to allow unlicensed use.

C. The Commission Should Not Impose Low Power Restrictions On PCS.

The Commission seeks comment on whether it should impose low power limits on 2 GHz PCS.⁴³ Low power systems may be desirable in some PCS environments because they can accommodate a larger number of subscribers in a given bandwidth than high power systems. Low power systems also offer several advantages such as inside building coverage, smaller handsets, longer battery life, and greater spectral efficiency through increased frequency re-use.

If the Commission truly wants to create a new service - not a mere substitute for traditional cellular service - there may be some merit to imposing a low power restriction on new PCS licensees. However, mandating low power for new PCS would not create parity between existing and newly licensed PCS providers and, for that reason, a low power restriction should be rejected. The allowable power levels should only be limited by the requirement that they be consistent with health and safety considerations.⁴⁴

⁴³NPRM, paras. 114-116.

⁴⁴Existing cellular carriers commonly use high power systems and may continue to use such systems in providing PCS.

No specific technology should be mandated or prohibited, and each provider should be free to select the applicable technology according to its individual requirements. The Commission should be flexible and should not dictate how either existing or newly licensed PCS providers serve their customers. All PCS providers should be treated equally and allowed the same flexibility to select and use the best available technology to meet their customer needs. Offering PCS providers a range of implementation options in this area would also be consistent with the Commission's goal of allowing the broadest range of competitive services to be made available to the public.⁴⁵

However, if high power levels are used for PCS, it will increase the need for standards and the need for the implementation of a common signal structure. Where both high power and low power systems are allowed, a common channel signal structure would be beneficial because it would allow high power systems to easily migrate to lower power operation as the number of subscribers grow. A common channel signal structure would also provide the mechanism for a smooth transition towards more spectrally efficient and rapidly integrated low power technologies. Therefore,

⁴⁵But, it is just as important for the Commission to recognize that this initiative will create additional cellular competition, and some competition for LEC local exchange service as well. Since that is the undeniable effect and result of the proposals, there should be no material difference in the way that the various PCS carriers or their respective services are regulated.

the Commission should encourage the development of industry standards for a common channel signal structure.

D. A Flexible Approach To Standards Is Recommended
And The Development Of Such Standards Should Be
Left To The Industry.

In the *NPRM*, the Commission concludes that it is not necessary to establish an FCC advisory committee on PCS technical standards at this time.⁴⁶ SBC supports this determination. The accomplishments of such organizations as CTIA, Telocator, Standards Committee T1, and TIA fully support the Commission's conclusion, and show that such bodies are ready, able, and willing to reach consensus on important new industry standards without convening a formal or official committee to advise the FCC.

As for the industry standards which should be developed, SBC believes that the common channel signal standard previously mentioned will be important in order to promote spectral efficiency and to allow high power systems to migrate to lower power levels as more subscribers are added. Industry standards to promote inexpensive universal handsets, capable of operating in a variety of environments, will be of similar benefit to consumers and should be encouraged. The Commission should likewise support industry standards that will allow nearby new PCS and fixed microwave systems to detect each other's presence, so they can operate in the same band of frequencies. SBC recommends that the

⁴⁶*NPRM*, para. 106.

Commission support, but not mandate, the development of industry standards in each of the above described areas.

E. The Commission Should Not Mandate A Particular Type Of Interconnection For PCS.

The Commission seeks comment on the type of interconnection that PCS may require to the public switched telephone network ("PSTN"), and on any associated requirements.⁴⁷ SBC is in favor of PCS provider access to the PSTN on reasonable terms and conditions. SBC also agrees with the Commission that it would be unwise to mandate any particular type of interconnection at this time. As the Commission acknowledges, it cannot be predicted how different PCS providers may want to interconnect with the LECs' PSTN or to alternative networks.⁴⁸

Instead, the actual type of interconnection should be determined at the local level by the LECs and the PCS providers. It should not be mandated by federal regulations. For the Commission to mandate the type of interconnection at this point could be counterproductive to the development of what may be the most appropriate type of interconnection for a given service or technology. SBC is willing to work with the appropriate bodies to develop the

⁴⁷NPRM, paras. 101 and 102.

⁴⁸NPRM, para. 100.

necessary standards to facilitate such interconnection as the PCS technologies and services are further developed.⁴⁹

F. 10 MHz Of Spectrum Will Not Be Sufficient To Support LEC Provision Of PCS.

The Commission suggests that LECs may be able to provide PCS with as little as 10 MHz of 2 GHz spectrum, and appears to be proposing that they be limited to that amount of spectrum.⁵⁰ SBC submits that the LECs should be allowed to participate in the new PCS licensing process on the same basis as any other applicant, and should not be arbitrarily limited in the amount of spectrum allowed to facilitate their participation in the provision of PCS. Hence, if 20 MHz of spectrum is made available to other applicants, then 20 MHz should be made available to the LECs. Absent such equality, the Commission will not be promoting true PCS competition and may be unwisely limiting PCS availability.

SBC's research also shows that 10 MHz of spectrum will not be sufficient to support many of the technologies of particular interest to the LECs. In order to provide wireless local access to the public switched telephone network, the wireless access portion of the network must be

⁴⁹NPRM, para. 100. If guidelines are established for such interconnection, the Commission should ensure that there is no difference in the quality of interconnection or in the charges for such interconnection between the existing (e.g., cellular) and newly licensed PCS providers. Each of those licensees should be treated equally in terms of the price and quality of the requested interconnection.

⁵⁰NPRM. para. 77.

equivalent to wireline voice and service quality. This implies a service quality (namely, geographical and temporal coverage) of 99%, a blocking rate of at most 1%, high reliability, and a voice coder that uses no less than 32 Kbps (kilobits per second). Overlapping coverage of radio base station coverage areas is also required to prevent service disruption caused by fluctuations in the RF environment or by failure of a single radio base station.

Based upon these and other studies, the minimum spectrum required for wireless local access systems is closer to 20 MHz, as opposed to 10 MHz, for wide area service.⁵¹ Possibly 25 to 30 MHz could be required in the markets where there is a high density of microwave usage and where spectrum sharing techniques are employed. Thus, the Commission should allow LEC providers to have license eligibility for between 20 and 30 MHz of the 2 GHz spectrum in their local market service areas.⁵²

⁵¹This assumes a single transceiver at each base station which provides 9 voice channels, even though in the residential environment more than one transceiver may be required to serve a set of microcells in areas of dense housing, such as condominiums. Bellcore has defined such a radio system as requiring a 2-way channel bandwidth of 800 KHz and a frequency reuse factor of between 16 (outdoor) and 25 (indoor).

⁵²As suggested earlier, the Commission may want to experiment by allocating 20 MHz in some markets and 25 to 30 MHz in others depending upon the fixed microwave system density. Such an approach would provide input on the use of PCS in both sharing and non-sharing environments.

V. CONCLUSION.

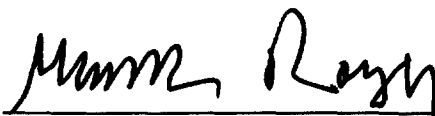
SBC believes that the Commission should separate the 900 MHz PCS issues, and allocate the 930-931 MHz band to providers of advanced messaging services.

The 2 GHz PCS issues require more consideration, and the public interest would be better served if the Commission were to allow more experimentation and research before making final decisions on many of the NPRM points.

All existing and newly licensed PCS providers should be treated equally in terms of service areas, spectrum allocation, licensing and regulation. Neither cellular carriers nor LECs should be prohibited from providing, or be disadvantaged in their provision, of PCS.

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CERTIFICATE OF SERVICE

I, Mark P. Royer, hereby certify that copies of the foregoing Comments Of Southwestern Bell Corporation have been served by first class United States mail, postage prepaid, on the parties listed on the attached.



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